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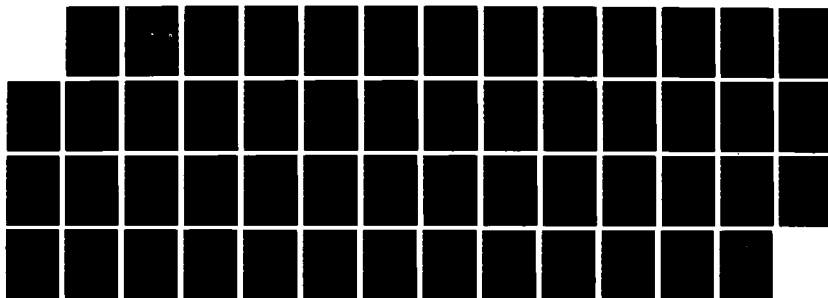
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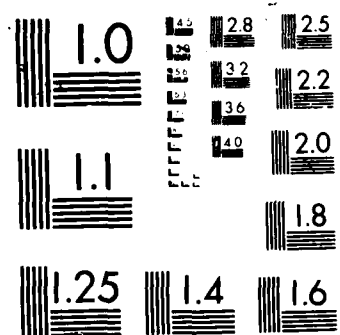
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## THESIS

ALCOHOLISM IN THE NAVY:  
AN UPDATED COST STUDY

by

Katherine A. Chase Irby

September 1987

Thesis Advisor:

R. A. McGonigal

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and to use his or her talents rather than to separate early from active duty.



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Alcoholism in the Navy:  
An Updated Cost Study

By

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B.A., Eastern Kentucky University, 1974

Submitted in partial fulfillment of the  
requirements for the degree of

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## ABSTRACT

A study to determine the costs incurred by alcohol abuse in the Navy was conducted at four residential alcohol rehabilitation facilities. This study determined cost in six areas: (1) damage to Navy property, (2) loss of work due to drinking patterns, (3) legal and administrative expenses, (4) cost of sick call visits, (5) loss of work due to associated medical problems and (6) cost of residential rehabilitation treatment. Cost of operating the rehabilitation facilities was determined by examining budgets of each facility. All other costs studied were determined by interviewing patients at these facilities. Costs incurred by the Navy because of an individual member's alcohol abuse, savings gained by rehabilitating a Navy member as well as loss incurred by not rehabilitating an individual were also determined. This study indicates that it is more cost effective to rehabilitate an individual than to let his abuse of alcohol continue and to use his or her talents rather than to separate early from active duty.

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## I. INTRODUCTION

Alcohol is a drug which has plagued mankind since recorded history. In Ancient Greece fines were given for verbal and physical attacks while under the influence of alcohol. In Ancient China where wine was introduced around 200 B.C. inebriation was considered injurious to health and reputation as well as being immoral.

Alcohol was introduced into the American culture in 1607 when early settlers brought it to the Virginia Colony. Ever since that time Americans have been plagued with the consequences of alcohol and its abuse.

The perceived pleasure and satisfaction of drinking alcoholic beverages as well as the economic benefits of producing and marketing alcohol are accompanied by several undesirable effects as well as several diseconomies. Diseconomies occur when an action taken by others results in uncompensated costs to others. The diseconomies of alcohol are as follows:

1. Alcohol-related traffic accidents, deaths, injuries and property loss.
2. Alcoholism, which is an addiction to the drug alcohol, with its attendant deterioration of physical and emotional health and social well-being.
3. Children born with alcohol-caused birth defects.
4. Poor job performance, accidents and time off work.
5. Spouse and child beatings along with other domestic discord.

6. Violent acts such as murder, suicide, assault, rape and other crimes, all of which are a drain on law enforcement, the courts and the penal system.
7. Other conditions which place a large burden on welfare, medical services, protective services, judicial services and health services.

Alcoholism is an extremely costly disease. All costs associated with alcohol abuse cannot be easily valued in monetary terms, i.e., health, life, personal relationships. However, monetary value can be placed upon things such as property, medical services and the time lost from the work environment or production.

The United States Navy has not been able to escape the consequences of alcohol. Because alcohol pervades life in America a large number of those who join the Navy have used alcohol prior to joining the naval service. Durning and Jansen [Ref. 1] report that extensive alcohol use, adverse consequences of drinking and permissive attitudes towards drinking were present among recruits prior to orientation into Navy life. This suggests that a significant proportion of those who join the Navy already have drinking problems. Perhaps, this is because alcohol use has been glamorized on the movie and television screens and because of large marketing efforts by alcohol producers. Boredom and peer pressure are known to contribute to the use of drugs. Because of alcohol's easy accessibility on naval installations as well as all other military installations it only follows that alcohol will be used to help cope with boredom.

#### A. PURPOSE

The purpose of this study is to determine Department of the Navy diseconomies associated with alcoholism and to review and evaluate the effectiveness of the Department of the Navy's inpatient alcohol rehabilitation facilities.

#### B. SCOPE

This study is prefaced with a view of the Department of the Navy policy on alcohol rehabilitation and an examination of the effectiveness of the Department of the Navy alcohol rehabilitation program. Alcohol related diseconomies which the Navy incurs are estimated. Cost data for each inpatient alcohol rehabilitation program studied is also presented. Finally, conclusions and recommendations are discussed.

## II. AN OVERVIEW OF THE NAVY'S INPATIENT ALCOHOL TREATMENT PROGRAM

In the following pages a brief history of the Navy's inpatient alcoholism treatment program, its objectives and elements will be reviewed. Effectiveness of this program in terms of established criteria, evaluative criteria, data collection and treatment methods, patient populations and costs will also be discussed.

### A. HISTORY OF THE NAVY'S INPATIENT ALCOHOL TREATMENT PROGRAM

#### 1. The Beginnings

Bunn [Ref. 2] states that the U. S. Navy's alcohol treatment program had its beginnings at the Naval Hospital, Long Beach, California in 1965 through the efforts of CAPT J. Gaska, M.C., USA and CDR R. Jewell, USN (Retired). The beginning was modest but highly successful. Fort [Ref. 3] acknowledges Senator Harold Hughes' most significant legislative effort, the Comprehensive Alcohol Abuse and Alcoholism Prevention and Rehabilitation Act of 1970. It was this legislation which gave the Navy's program the support it needed for further development. The official summary of the bill states:

This legislation would establish administrative structure and authorization for an unprecedented, massive, across-the-board federal attack upon the problem of alcoholism in this country.

Fort [Ref. 3:p. 155] also states that this legislation is the mandate which caused the federal government to recognize alcoholism as a health problem and to vacate its previous position of considering alcoholism a criminal problem.

## 2. The Objectives

OPNAVINST 5350.4 states that the Navy will participate in alcohol rehabilitation efforts. This instruction further states that:

The U.S. Navy Drug and Alcohol Abuse Control Program affirms the Navy's recognition of the social problems of drug and alcohol abuse and the responsibility of the Navy to actively participate in control and rehabilitation efforts.

In striving to meet this responsibility, the Drug and Alcohol Abuse Control Program pursued five broad objectives:

1. To prevent and eliminate drug and alcohol abuse within the Navy.
2. To identify Navy personnel involved in drug and alcohol abuse.
3. To counsel and rehabilitate members involved in drug and alcohol abuse restoring to full duty those who have potential for continued service and aid in adjustment into civilian life for those who are not rehabilitated.
4. To remove the stigmatic effects associated with alcoholism and drug abuse which mitigate against proper referral for treatment and subsequent restoration to duty.
5. To promote acceptance of the rehabilitated drug abuser and the recovered alcoholic as useful, reliable members of the Navy community.

## 3. The Expansion

Before 1972, the principal treatment for alcoholism was admission to a naval hospital. The patient was usually

admitted to psychiatric services where treatment emphasis was on detoxification, medical management, psychiatric observation and any other benefits that could be derived from the medical environment. During this time it is believed that many others were treated for alcoholism under the guise of various physical complaints. This was mainly because of the negative attitudes towards those whose alcohol usage had gotten the best of them. With the emergence of more enlightened attitudes towards those with alcoholism and modest pioneering efforts specialized rehabilitation facilities were developed.

#### B. THE INPATIENT PROGRAM ELEMENTS

##### 1. Yesterday's Inpatient Program

The first specialized facilities were the Alcohol Rehabilitation Centers (ARC's). They were and still are staffed by Navy line and civilian personnel. At the same time Alcohol Rehabilitation Units (ARU's) were established at Navy hospitals. ARU's were established at Navy hospitals to meet the growing need for treatment facilities and to accommodate personnel at locations closer to their duty stations. They were staffed by Navy medical doctors, nurses, corpsmen and civilian personnel.

Alcohol rehabilitation centers and units had a number of similar program elements such as counseling by recovering alcoholics, structured programs including lectures, group counseling, marital counseling and organized



recreation. Furthermore, the program uses the principles of Alcoholics Anonymous as the core from which all program elements radiate. [Ref. 2]

## 2. Today's Inpatient Program

Today's inpatient program consists of three alcohol rehabilitation centers and twenty-four alcohol rehabilitation services (ARS). The services are located in Naval hospitals. They, like the alcohol rehabilitation units, have the extra benefits incurred by being located in a medical environment.

The programs at the ARC's and ARS's are organized very similar to where the ARC's and ARU's were in 1972. However, today's programs include psychodrama, couples group and physical training as well as those elements mentioned above.

## C. ASSESSMENT OF THE NAVY'S ALCOHOL REHABILITATION PROGRAM

In 1977, Bucky performed eleven evaluative studies on the effectiveness of Navy alcohol rehabilitation, alcohol safety action and alcoholism counselor training programs. A brief description of these studies and their findings are presented below

### 1. Evaluating Criteria

Eight criteria were used as measures of effectiveness of the Navy's alcoholism program. These

measures included observations of behaviors and psychological test data. They are:

- a. Completion of enlistment and recommendation for those individuals who complete treatment and have a minimum of six months prior to expiration of enlistment.
- b. Frequency of sick call visits and length of hospitalizations for a two year period before and after completion of treatment.
- c. Performance of duty.
- d. Changes in psychological test data.
- e. Changes in drinking habits.
- f. Changes in attitudes toward drinking.
- g. Frequency of disciplinary difficulties before and after treatment.
- h. Discharge rates and types of discharges for those who complete treatment.

## 2. Data Collection Method

During the year 1978, patients admitted for treatment at an ARC or an ARS were administered a biographical questionnaire and two personality tests.

### 3. The Biographical Questionnaire

This questionnaire consisted of 112 items which asked questions pertaining to the patients background, i.e., ethnic group, present religion, sex, type of work parents performed, etc. A list of these questions is contained in Appendix A.

### 4. The Personality Tests

Three personality tests were administered. They were the Comrey Personality Scales, the Mini-Mult, a short form of the Minnesota Multiphasic Personality Inventory and

the State Anxiety Scale. The Comrey Personality Scales contains scales for validity, response bias, trust, orderliness, social conformity, activity<sup>6</sup>, emotional stability, extraversion, masculinity and empathy. The Mini-Mult includes three validity scales and scores on hypochondriasis, depression, hysteria, psychopathic deviate, paranoia, psychasthenia, schizophrenia and mania. The State Anxiety Scale of Spilberger's State/Trait Anxiety Inventory was also included for measuring personality changes.

All of the items listed above included the social security number of the individuals tested. This facilitated the semi-annual matchings of the then Bureau of Naval Personnel data and the then Bureau of Medicine and Surgery data tapes so that a complete work performance and medical history could be obtained for each participant.

#### 5. Evaluative Data

Evaluative data was collected in twelve areas. These areas included completion of enlistment and recommendation for reenlistment, work performance evaluation by the commanding officer, change in psychological test data, discharge, recidivism, psychodrama, officers, women, biofeedback/stress reduction, Navy Alcohol Safety Action Program (NASAP), Alcoholism Counselor Training and familial and non-familial alcoholism. This study will limit its review to the first nine areas. This is because the study of familial and non-familial alcoholism and NASAP do not

measure treatment effectiveness and biofeedback. Stress reduction is not a routine component of the treatment regime.

6. Treatment Effectiveness

a. Completion of Enlistment and Recommendation for Reenlistment

(1) Young Alcoholics. According to Bucky [Ref. 4:p. 8] when the data gathered from patients of ARC's between 1 Jan 1972 and 1 Apr 1975 was divided into two segments with one segment including those 25 years old and younger and the other group 26 years old and older, the older group showed an effectiveness rate of 84% and the younger group showed an effectiveness rate of 53%. A more recent study based on three years after treatment reveals effectiveness rates of 82.2% for the older group and 46.1% for the younger group of patients treated at ARC's/ARS's. This study was conducted in 1976 by Bucky. [Ref. 5]

(2) Black Alcoholics. Using the same criteria as above, black alcoholics have an effectiveness rate slightly higher than the general population, approximately 76%. However, very junior black alcoholics have a very poor chance for effectiveness when compared to their white counterparts. A black in the lowest two enlisted pay grades has an effectiveness rate of less than 17% but the white enlisted in these two pay grades has a 43% effectiveness rate. Black alcoholics in the pay grades of E-3 have a 50% probability of effectiveness and a white E-3 has a

probability of effectiveness of 63%. However, the probability of effectiveness for blacks in the pay grade of E-4 is substantially higher, 81%, than the effectiveness probability of his white counterpart. The effectiveness rate for all black alcoholics in the pay grades of E-4 and above remains substantially high. [Ref. 4:p. 7]

A more recent study was done with a larger criterion period which verified the results of reference 5. It revealed that young white alcoholics have a 49% probability of treatment effectiveness. It also showed that older black and white alcoholics have an 84% probability of effectiveness. Black alcoholics in the lowest two pay grades had a 27% chance for effectiveness. The overall Navy reenlistment rate for those on their first enlistment was 13.15%. The reenlistment rate for overall Navy career personnel was 47.2% as compared to 42.6% for those who had received care at ARC's. [Ref. 4:p. 7]

(3) Centers vs. Services. The overall effectiveness rate for ARC's when the criterion of completing enlistment and being recommended for reenlistment are used is 71.8%. The probability of effectiveness for the young alcoholic is 58.3% while the probability of effectiveness for the older alcoholic is 84.1%. The overall effectiveness rate for those treated in ARS's is 71.1%. The chance that treatment of the young alcoholic will be effective is 44.2% while the effectiveness probability for the older alcoholic is 90.7%.

It should be noted that it appears that individuals treated at ARS's have more serious alcohol problems as well as more severe emotional and physical difficulties. While the ARC's patients tend to be somewhat younger but with a longer history of alcoholism. [Ref. 4:p. 7]

b. Performance of Duty

The patients' Commanding officer received a questionnaire at intervals of six, twelve, and twenty-four months after the patient completed treatment. The commanding officers evaluated work performance, military behavior, leadership, adaptability, military appearance, disciplinary record, drinking and medical records.

An analysis of these evaluations indicate that 90% received excellent or good ratings on work performance, 86% received good or excellent on military behavior, 82% received the same ratings in leadership, while 87% received good or excellent in adaptability and 91% received these ratings in military experience.

The commanding officer was asked if the individual who had been treated had any post treatment difficulties while at the command. Data collected from the twenty-four month commanding officer evaluations indicated that almost 74% had not received disciplinary action and that only 8% had had more than three such actions taken against them during the first two years after treatment.

The evaluations of the commanding officers also indicated that 77% of the individuals were described as not drinking or drinking infrequently two years after treatment, 23% were described as drinking often. [Ref. 4:pp. 11-12]

c. Change in Psychological Test Data

A study was conducted which compiled scores received from three psychological tests. These tests were given to 10,489 alcoholics who were treated at either an ARS or ARC between April 1, 1974 and June 30, 1978. The results are discussed below.

(1) Comrey Personality Scales. Pre and post treatment scores on this test revealed that patients were close to average on seven of the eight personality scales. Following treatment, patients reported a significant increase in their level of trust, activity, extraversion and emotional stability.

(2) Mini Mult. After treatment, patients showed a decrease on nine of the eleven scales which reflect pathogenic characteristics. The results indicated that after treatment less anxiety, paranoia and depression were reported. There was less probability of acting out aggressively and sexually and there was less of the feeling of being different. It must be noted that these results must be viewed rather cautiously because of the questionable validity of the Mini Mult.

(3) Anxiety Questionnaire. When patients were admitted to the ARC they were high in state anxiety or

anxiety related to a particular situation. This anxiety decreased from 46% to 34% over the time that the patients were in the ARC. [Ref. 4:p. 11]

d. Discharge

The criterion for this study was the type of discharge for enlisted Naval personnel who completed treatment at one of the alcohol rehabilitation facilities and were later discharged. A positive type of discharge was considered to be an honorable discharge without such qualifiers as unfit or unsuitable. 4,688 discharges were examined. 41% of those in their first enlistment and 64% of those who were in at least their second enlistment received positive discharges. 50% of those in their first enlistment and 22% of those in at least their second enlistment received negative discharges. The others either received medical discharges or discharges that were neither positive or negative, i.e., convenience of the government, death, hardship. [Ref. 4:p. 12]

e. Recidivism

In the past recidivists, those who have had treatment at an ARC/ARC at least twice, were considered failures. However, because many productive recovering alcoholics had to put their ability to stay sober to a test, Bucky's criterion for evaluating the effectiveness of treatment for recidivism was six months after the second treatment. The study revealed an overall effectiveness rate of 70%. The effectiveness rate for those over twenty-five



years old was 82%. Recidivists with at least twelve years of service had a 94% chance for effectiveness and those in the pay grade of E-7 or above had a 100% effectiveness rate. [Ref. 4:pp. 13-14]

f. Psychodrama

This study found that patients who were assigned to psychodrama scored lower on the Comrey Personality Scales in five areas: trust, activity, emotional stability and extraversion than those patients not assigned to psychodrama. After psychodrama there were no major differences between the groups as measured by the Comrey Personality Scales. [Ref. 4:p. 14]

g. Officers

Forty-eight officers and their supervisors were interviewed one year after treatment. Data was gathered on job performance, abstinence, recommendations for promotions and psychological changes. An analysis of this study showed that supervisors rated 85% of the former patients as good or excellent in job performance one year after treatment whereas only 27% were rated good or excellent prior to treatment. 73% of the patients reported that they were abstinent and 78% of the supervisors rated their officers as abstinent. 68% of the officers would have been recommended for promotion by their supervisors. Finally, the study indicated a significant improvement on emotional stability, activity, extraversion and anxiety. [Ref. 4:pp. 14-15]

#### h. Women

A study of forty-eight enlisted women and 200 enlisted men who were treated at many alcohol facilities was conducted. It revealed that age, positive relationships to other females, infrequent acting out and pay grade are positively related to treatment effectiveness for women. [Ref. 6] The study revealed a difference in treatment effectiveness for males and females. The females had an overall effectiveness rate of 71% but the males had an overall effectiveness rate of 77%. However, the study indicated that young females have a slightly higher effectiveness rate than young males, 64% as compared to 61%. Older females have a slightly lower probability of effectiveness than older males, 89% as compared to 91%. [Ref. 4:p. 15]

#### D. A COST BENEFIT ANALYSIS

The Bureau of Naval Personnel's cost benefit analysis indicates that rehabilitation is 2.2 times as beneficial as replacement for the overall Navy population but 5 to 1 times as beneficial as replacement for the older, career population. [Ref. 6] Details of this study can be found in Appendix B.

#### E. SUMMARY

The history, objective, effectiveness and benefits of the Navy's inpatient alcoholism treatment program were discussed. Over the years the program appears to have

expanded its program elements but the core of the program has not changed. This program has undergone numerous evaluative studies concerned with treatment effectiveness on various patient populations, evaluative criteria as established through program objectives, methods of treatment and cost benefit analysis. These studies indicate that, overall, the inpatient alcoholism treatment program is effective in that the probability of an individual meeting the eight evaluative criterion for success is relatively high. However, the probability of effectiveness for the younger enlisted population, younger black population, female population and officer population is not as high as the probability of effectiveness for the older enlisted population.

### III. RESEARCH DESIGN AND PROCEDURES

As was stated earlier, the purpose of this thesis is to inquire further into the costs incurred by the Navy due to alcoholism. Therefore, this thesis will address some peculiar costs due to alcoholism and the cost-effectiveness of the Navy's residential alcoholism treatment program.

Because of the small size and somewhat skewed nature of the sample examined, this work represents only a model by which a cost benefit analysis of the Navy's residential alcohol rehabilitation program can be conducted.

#### A. RESEARCH DESIGN

In order to ascertain costs caused by alcoholism it was decided that the best method for gathering such data would be to go directly to those identified as alcoholics because: (1) to date, a system for collecting such data has not been implemented, and (2) surveying service and medical records is inefficient because these records do not specify which incidents, i.e., disciplinary action, illness, physical injury, etc., are related to alcohol abuse. Only the individual service member really knows these facts. Therefore, a structured interview was designed as the instrument for gathering the needed data.

The interview was structured so that (1) the alcoholic would have an opportunity to develop trust in the

interviewer, this makes the probability of receiving honest responses more likely; (2) to obtain the information desired and, (3) to keep the interview flowing.

The interview consisted of questions which gather data in five areas of interest. These areas were: (1) cost of damage to Navy property because of alcohol abuse; (2) cost of lost productivity due to medical problems which were alcohol related; (3) cost of alcohol-related absenteeism due to drinking patterns; (4) cost of legal procedures which were related to alcohol abuse; and (5) demographic information about the alcoholics interviewed. The interview questions are found in Appendix A.

#### B. PROCEDURES

Patients at the Alcohol Rehabilitation Service, Naval Hospital, Oakland, California; Alcohol Rehabilitation Service, Naval Hospital, Long Beach, California; Alcohol Rehabilitation Drydock, Pearl Harbor, Hawaii; and Alcohol Rehabilitation Center, San Diego, California, were interviewed. Only those patients who had completed at least three weeks of treatment and who had no objection to participating were interviewed. This was done because it was felt that those who had volunteered to participate would be more honest in their responses than those who had recently begun treatment or those who had been forced to participate in this study. Thus, twenty-two patients who fitted the criteria were selected to participate in this

endeavor. Both enlisted and officer personnel were interviewed. However, because only one officer was interviewed, his responses were deleted from the study. Therefore, this study is forced to focus on behavior patterns of enlisted personnel who suffer from alcoholism. The small number of officer alcoholics will be discussed in Chapter IV.

### C. COST DERIVATION

Assumptions made in deriving the results which follow were based on seven factors. They are:

1. The information gathered from interviews was truthful.
2. The experience of the author.
3. The experience of Naval personnel working in this field.
4. Percentages of alcoholics in the Navy which are based on the results of the 1982 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel.
5. Pay rates based on NAVCOMPTNOTE 7041, effective 1 Jan 1984.
6. Navy manpower based on NAVPERS 15658, 2nd Quarter FY-84.
7. Opinions from Navy professionals in the fields of administration, legal procedures and others who have served in key command positions, i.e., Executive Officer, Command Master Chief, Division Officer, etc.

As was the case with Sanders [Ref. 7], the man hour is used for determination of cost. Information received from the interviews was transposed into hours of lost

productivity and multiplied by the appropriate hourly pay rate. This yields the average cost per alcoholic of a specific pay grade for one year.

$$\begin{array}{rcl} \text{Man Hours} & & \text{Hourly Wage} \\ \text{of Lost} & \times & \text{Per} \\ \text{Productivity} & & \text{Pay Grade} \\ \text{Year} & & \end{array} = \begin{array}{l} \text{Cost per Alcoholic} \\ \text{Per Pay Grade Per} \\ \text{Year} \end{array}$$

Once the cost per alcoholic per pay grade per year is calculated, it is multiplied by the number of alcoholics in the specified pay grade to yield an annual cost per pay grade.

$$\begin{array}{rcl} \text{Cost Per Alcoholic} & & \text{Number of Alcoholics} & & \text{Annual Cost Per} \\ \text{of a Specified} & \times & \text{in the Specified} & = & \text{Specified Pay} \\ \text{Pay Grade Per} & & \text{Pay Grade} & & \text{Grade} \\ \text{Year} & & & & \end{array}$$

The number of alcoholics was determined by consulting the 1982 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel. According to Bray [Ref. 8], 12 percent of Navy personnel are alcohol dependent.

#### D. DAMAGE TO NAVY PROPERTY

There was only one instance of damage reported by the alcoholics interviewed. This was the total destruction of a guard house. The assumption is made that the replacement of a guard house will cost at least \$2500. To determine the average cost of damage of Navy property per alcoholic per year, the total cost of damage is divided by the number of alcoholics interviewed. Therefore, an average cost of

damage per alcoholic per year could be calculated as follows:

$$\frac{\$2500}{22} = \$113.63 \text{ per alcoholic per year.}$$

This yields a total annual cost of property damage of \$6,800,618.

#### E. LOSS OF WORK DUE TO MEDICAL PROBLEMS

According to Sanders [Ref. 7] the amount of time lost from the job because of physical injury or medical side effects caused by alcohol consumption patterns was alarming. There were twenty-two cases of broken bones and internal problems. However, this investigation found only two alcohol-related injury/illnesses which required time off from work for recovery. The average time off from work was only 1.88 days. This yields an annual cost of \$79.99 per alcoholic in pay grade E1; \$89.43 per alcoholic in pay grade E2; \$98.76 per alcoholic pay grade E3; \$117.37 per alcoholic in pay grade E4; \$139.08 per alcoholic in pay grade E5; \$168.97 per alcoholic in pay grade E6; \$202.08 per alcoholic in pay grade E7; \$233.61 per alcoholic in pay grade E8; and \$271.57 per alcoholic in pay grade E9. There is an average of \$136.88 lost per individual because of lost work due to medical problems. This is equal to \$6,195,510 lost per year due to illnesses of alcoholics.



#### F. COST OF SICK CALL VISITS

An office call to a private physician cost approximately \$35. Medical comptrollers have computed the charge for military sick call at \$56 per visit. There was an average of two sick call visits per alcoholic for a cost of \$112 per alcoholic. This yields a total cost of \$6,296,957. This total when added to the annual cost of time lost due to alcohol related medical problems amounts to \$14,023,300.

#### G. LOSS OF WORK DUE TO DRINKING PATTERNS

To calculate the cost of lost work time, it is necessary to multiply the estimated average number of hours lost per individual per year by the hourly wage rate of each individual rating. This assumes that the difference in pay does not influence the number of hours lost from the work environment. 9.57 hours per alcoholic per year times the hourly pay grade equals the annual cost of lost time from work per alcoholic per pay grade. In this study there was an average cost of \$21.20 per individual interviewed. This yields an annual loss of \$3,299,869 for pay grades E1 through E9.

#### H. LEGAL AND ADMINISTRATIVE EXPENSES

This area is also an area where many real costs are incurred as a result of a large loss of productive man hours. This area of cost is very large because it not only involves the alcoholic, but the leading petty officer, division officer, department head, the command master chief,

legal officer, executive officer, commanding officer, witness(es), a recorder and Personnel Support Detachment personnel. Additionally, data indicated that on the average 55% of those interviewed had been involved in formal legal proceedings.

Since the primary aim of this thesis is to calculate a minimum estimate of cost, the procedure followed in determination of legal and administrative expenses was to: (1) assume all military cases were handled by Non-Judicial Punishment (NJP); (2) assume minimum ranks and rates of personnel involved and minimum time expended for the entire proceeding.

A typical scenario of NJP could be as follows:

1. An individual is suspected of being inebriated while on duty.
2. The suspect is sent to security for breath analysis.
3. The results of the breath analysis indicate that the suspect is legally intoxicated.
4. The intoxicated individual is placed on report.
5. The Legal Officer prepares a complete report chit.
6. The accused is counseled by the Legal Officer.
7. The witness(es) are interviewed by the Legal Officer.
8. The Commanding Officer and Legal Officer discuss the case.
9. NJP is held.

Those participating at NJP are:

- a. The Commanding Officer
- b. The Executive Officer
- c. The Department Head

- d. The Division Officer
- e. The Leading Petty Officer
- f. The accused
- g. The Command Master Chief
- h. The witness
- i. The recorder

10. The Commanding Officer disposes of the case.

11. The results of the case are entered into the service record.

12. The Disbursing Officer makes appropriate entries.

The cost involved in a typical NJP are presented below.

#### NJP Cost

<u>Participant</u>	<u>Pay Grade</u>	<u>Time Required</u>	<u>Hourly Wage</u>	<u>Total Wage</u>
Legal Officer	O2	2 hr	\$14.85	\$29.70
Accused	E2	2 hr	5.95	11.90
Witness	E5	1 hr	9.25	9.25
Recorder	E4	.5 hr	7.80	3.90
Command Master Chief	E9	.5 hr	18.06	9.03
Leading Petty Officer	E6	.5 hr	11.23	5.62
Division Officer	O1	.5 hr	12.09	6.04
Department Head	O4	.5 hr	22.69	11.35
Executive Officer	O5	.5 hr	26.70	13.35
Commanding Officer	O6	.25 hr	32.06	8.01
Personnel Clerk	E5	.25 hr	9.25	2.31
Pay Record Clerk	E5	.5 hr	9.25	<u>4.62</u>

Total \$115.08

In accordance with the NJP cost there is an estimated total cost of \$115.08 spent on a typical alcohol-related offense. The total legal expense incurred by the Navy for the population interviewed is therefore estimated to be \$1441.58. The estimated average cost per interviewee is \$120.13. The estimated average cost of NJP for an enlisted Navy member is \$123.88.

In calculating the cost of NJP per enlisted alcoholic per year, the assumption is made that the number of NJP's per year is the same as reported by Sanders (Ref. 7). Therefore, the cost of alcohol related NJP is calculated as follows:

$$\frac{\$123.88}{\text{NJP}} \times \frac{.42 \text{ NJP}}{\text{Alcoholic}} = \$52.03 \text{ per alcoholic per year}$$

This yields a total legal expense of \$52.03 per alcoholic per year. It should be noted that this estimate is based on legal cost calculated for an E-2 therefore the pay of the accused is in most cases minimized. This means that the total expense given above is a very low estimate. Using the above figure there is an annual total cost of \$3,113,734 for alcohol related NJP for enlisted personnel.

#### I. COST OF RESIDENTIAL REHABILITATION TREATMENT

To calculate the cost of the residential rehabilitation program, the FY 1983 operating budgets for the alcohol rehabilitation drydock and center studied was obtained. The budget for the drydock was only \$204,426. The average cost of rehabilitation at this facility for FY 1983 was \$1331.17. The combined budgets of the alcohol rehabilitation center examined were \$1,080,104. The average cost to rehabilitate an individual at an ARC was \$1517. In determining the cost to operate the alcohol rehabilitation services, it was necessary to obtain estimates of operating costs from the Comptroller of the Naval hospital to which the ARS was attached. This is because the operating costs are contained

within the hospital's overall operating costs. The estimated cost of operating ARS, Long Beach is \$674,672. ARC, Oakland's operating cost was estimated to be \$281,666. These two costs are averaged for an average operating cost of \$478,169. The average cost to treat a patient at these facilities is \$1473. The average cost to rehabilitate a patient at all facilities examined is \$1223. All operating costs are based on four expense elements. They are: (1) utilities, (2) staff salaries, both military and civilian, (3) supplies and (4) vehicles. The annual operating cost of the facilities studied is estimated to be \$2,240,868.

#### J. SUMMARY

In this chapter the design of the research methodology was presented. The procedures used for obtaining costs incurred by the Navy because of enlisted personnel alcohol abuse was discussed. Cost estimates were derived in the areas of (1) damage to Navy property, (2) loss of work due to alcohol-related medical problems, (3) cost of sick call visits, (4) loss of work due to drinking patterns, (5) legal and administrative expenses and (6) the cost of operating the residential alcohol rehabilitation program. The average cost to the Navy to rehabilitate an individual at the facilities studied is \$1667. These six costs are combined for a total annual cost of \$27,947,557 which is incurred because of enlisted alcohol abusers in the Navy.

#### IV. ANALYSIS

The results of the interviews as well as the calculation of costs for this study are critically examined and discussed below.

##### A. RESULTS OF INTERVIEWS

###### Sample Profile

<u>Pay Grade</u>	<u>Percentage</u>
E2	21.05
E3	21.05
E5	26.31
E6	10.52
E7	21.05

Years of Service: minimum = 1.5, maximum = 23, mean = 8.32

Age: minimum = 19.33, maximum = 42, mean = 27.65

Sea Duty: minimum = 0, maximum = 7.5, mean = 3.61

Marital Status: Married = 36.85%, Divorced = 15.78%

Never Married = 47.36%

Prior residential treatment was reported by 11.76%; participation in the Navy Alcohol Safety Awareness Program was reported by 17.64% and 70.58% reported no previous participation in any type of alcohol abuse program.

Two or more alcohol-related sick calls were reported by 47.05% of those interviewed; 29.41% reported no alcohol-

related to sick calls. The maximum number of sick calls reported by one respondent was twelve.

42.10% reported alcohol-related tardiness. The minimum amount of lateness reported was fifteen minutes, the maximum amount of lateness reported was four hours. Lateness was reported to have occurred as many as twenty-four times by one patient.

26.31% reported accidents which occurred because of alcohol abuse. Only one accident was reported which involved personal injury to the alcoholic and required medical attention. There was also only one incident involving damage to Navy property reported, this was the destruction of a guard house by a privately owned vehicle.

23.52% of those interviewed reported non-judicial punishment and 5.88% reported civilian court appearances. When asked if they intended to make the Navy a career, 50% indicated that they did, 31.25% were uncertain and 18.75% did not plan on making the Navy into a career.

When asked what the thought of the treatment program that they were currently participating in, 100% indicated that they liked it. They rated the program from good to superb.

## B. THE ANALYSIS

The sample size was small, .02% of the estimated enlisted alcoholic population. Furthermore, it does not represent a cross section of the enlisted rate structure.

These two facts along with the fact that costs were derived from responses which were not verified, makes the accuracy of the cost estimates questionable.

Of the five areas investigated, absence due to medical problems appears to be the area where most costs are incurred. When this cost is combined with the cost of sick call visits and the cost of rehabilitation, it is easy to see that medical costs are by far the most costly expense which is incurred because of alcoholism.

The cost of legal expense was perhaps a much lower estimate than the actual cost incurred. This is because the two estimates used for the basis of this cost only included intoxication while on duty and driving while intoxicated. There are other alcohol-related offenses which occur, i.e., assault, battery, manslaughter, etc., but this study ignored them.

All costs were based on a recent study by Bray which concludes that 12% of the Navy's population is alcohol dependent. By using only this category of the population, this study implies that only alcohol-dependent personnel cause the Navy to incur costs that would most likely have been avoided if alcohol had not been consumed. This does not take into account costs which may have been incurred because of heavy consumption, moderately heavy consumption, etc.

The annual cost of operating the twenty-four ARS's is another area where costs could easily be unrepresentative of



actual cost incurred. This is because this calculation is based on the average cost of two ARS's which are located in the same state. Therefore, one element of this calculation, utilities, could be high for other ARS's but low for others.

The populations at all the treatment facilities visited had few, if any, officer personnel undergoing rehabilitation. One facility had a patient population of twenty-five and another had twenty, but no officers were present in either. Another facility had a population of sixty-two and another had eighty, yet there was only one officer undergoing treatment at both facilities.

#### C. SUMMARY

The analysis discussed the profile of the enlisted alcoholic as well as presenting a critical examination of the method used in determining cost in the areas of cost under investigation.

## V. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are made as a result of the information which has already been presented in this study as well as data gathered from those interviewed and observations made by the author. Recommendations which are presented are considered possible to implement but the fact is that all personnel in positions of responsibility must support any policy for it to be effective.

### A. GENERAL CONCLUSIONS

The results of this study show that costs incurred by the Navy because of alcoholism are high. The costs derived in this study are not to be considered the actual alcohol-related costs incurred by the Navy because alcoholism but rather a figure from which some realistic idea about the cost of alcoholism can be gleaned. This is because many restrictive assumptions were used and because the sample studied was too small to be considered truly representative of all enlisted personnel who suffer from alcoholism.

According to this study the Navy incurs a loss of \$431.77 per enlisted alcohol abuser per year in property damage, alcohol related medical problems, sick call, loss of work because of drinking patterns and legal and administrative expenses. An estimated \$27,947,557 in

expenses is incurred annually by the Navy because of enlisted alcohol abusers. It is estimated that the Navy spends \$1223.23 to rehabilitate an alcoholic.

Observations made of those participating in the rehabilitation program and comments made by those on the staff of all facilities examined point to the fact that officer personnel are not being afforded the opportunity to get their drinking problems under control by undergoing rehabilitation. There were several theories as to why officer personnel were not participating in alcohol rehabilitation. The three most widely espoused theories as to why officers are not fully participating in alcohol rehabilitation programs are:

1. If an officer goes to an alcohol rehabilitation facility his record is permanently stained and his career will come to a premature end.
2. The supervisor of an officer, who is usually an officer, feels that he is doing his fellow officer a favor by overlooking the abusive alcoholic behavior his subordinate is displaying.
3. Officers do not think that they or their fellow officers can become victims of alcohol abuse; alcoholism is something that only victimizes the enlisted man.

#### B. RECOMMENDATIONS

All but two of the recommendations which follow are recommendations for policy concerning alcohol abuse.

1. Continue the alcohol rehabilitation program.
2. Use the model presented in this thesis to conduct a Navy wide impact study.

3. Implementation of a system which accounts for alcohol-related costs. This would require input from security, medical services as well as commanding officers.
4. Education of all Navy personnel in the area of alcoholism and each individual's potential role as a victim of alcoholism, as an alcoholic, a co-alcoholic or casualty.
5. Education of supervisors on the proper way to manage alcoholic personnel.
6. Stop the sale of alcohol during normal working hours at shore activities.
7. Stop the toleration of alcohol in the work spaces.
8. Adopt tougher attitudes towards alcohol abusers; no more turning your back on someone who is intoxicated during work hours; no pity for those suffering from over-indulgence of alcohol.
9. Implement a Navy wide procedure for handling offenses involving alcohol. This procedure could be as follows: the first alcohol-related offense requires the forfeiture of one month's pay; the second offense will require alcohol rehabilitation and the third offense would require mandatory separation from the service. It must be kept in mind that although this method of handling repeat alcohol offenders seems harsh these stiff penalties may grab the attention of potential alcohol abusers and may deter abusive alcohol behavior.

APPENDIX A  
BIOGRAPHICAL QUESTIONNAIRE

The following questions were asked of alcohol rehabilitation patients by Bucky between 1 July 1974 and 30 June 1977:

1. Is the service your career?
2. Present religion?
3. Ethnic origin?
4. Branch of service?
5. Years active service?
6. What is your present pay grade? (Enlisted)
7. What is your present pay grade? (Officer)
8. What is your present pay grade? (Warrant Officer)
9. How old were you when you first entered service?
10. What is the highest pay grade ever held? (Enlisted)
11. What is the highest pay grade ever held? (Officer)
12. What is the highest pay grade ever held?  
(Warrant Officer)
13. Reduced in rank or pay grade?
14. Command attached - admitted to Alcohol program?
15. Specialty - Navy?
16. Designated striker - Navy?
17. Satisfied with specialty?
18. GCT/ARI?
19. Education prior to service?
20. Full time trade school?
21. Pass a high school equivalency test?

22. Suspended - expelled from grade school/high school?
23. Setback?
24. Courses failed in high school?
25. High school grade average?
26. Academic honors?
27. Athletic honors/letters?
28. Military honors?
29. Sick call - past year?
30. Sick list - hospitalized past year?
31. Days (total) sick list - hospital past year?
32. Put on report - times?
33. Captain's mast? (Marines - Office Hours)
34. Court martialed?
35. Times in brig?
36. Full time job - before first enlistment?
37. Moving traffic violations - past 3 years?
38. Before age 15, times run away from home?
39. Played hooky - last 2 years full time school?
40. Police or arrest record prior to 16 years old?
41. Arrest record - misdemeanor since 16?
42. Adult arrest - felony since 16?
43. Reform school?
44. Time in civilian jail?
45. Wandered around more than 3 months - no job?
46. Alias?
47. Disciplinary action pending?
48. 1 year average - coffee per day?

49. Before service - treated by mental health worker, psychiatrist, psychologist, social worker?
50. Average past year - cigarettes a day?
51. Present marital status?
52. How many times married?
53. How many sons?
54. How many daughters?
55. - 58. How many years raised by:
55. Real father?
56. Real mother?
57. Foster, adoptive or stepfather?
58. Foster, adoptive or stepmother?
59. Were you adopted?
60. Man you lived with longest?
61. Woman you lived with longest?
62. Years of regular school (step/real/adoptive/foster father)?
63. Years of regular school (step/real/adoptive/foster mother)?
64. Type of work - father?
65. Sisters (lived till 13th birthday)?
66. Half-sisters (lived till 13th birthday)?
67. Brothers (lived till 13th birthday)?
68. Half-brothers (lived till 13th birthday)?
69. Relatives (mental-general hospital for mental or nervous problems)?
70. Relatives returned to normal self?
71. Relatives seen by psychiatrist, psychologist or other mental health worker for nervous/mental problem?

72. Relatives convicted of felony?
73. Relatives depressed 2 weeks or more - couldn't carry on usual activities?
74. Relatives - health problems abuse of illegal prescriptions?
75. Total of relative problems questions 69 - 74?
76. Relatives with all 5 problems?
77. Relatives with only 4 problems?
78. Relatives with only 3 problems?
79. Relatives with only 2 problems?
80. Relatives with only 1 problem?
81. Present wife/husband had drinking problem?
82. Previous wife/husband had drinking problem?
83. Age first missed time on job because of drinking?
84. Age first demoted because of drinking?
85. Age first AWOL because of drinking?
86. Age first auto accident because of drinking?
87. Age first picked up for drunk driving?
88. Age of first disciplinary action because of drinking?
89. Age first separated/divorced from wife because of drinking?
90. Age first went into hospital because of drinking?
91. Age doctor said stop drinking?
92. Seriously tried to stop drinking?
93. Years you think you have had a drinking problem?
94. Longest time you participated in A.A.?
95. Longest you have stayed on wagon since having problems with alcohol?
96. Ever had shakes morning after?



97. Ever had hallucinations?
98. Ever had convulsions?
99. Ever vomited blood?
100. Ever had blackouts?
101. Doctor said you had pancreatitis?
102. Doctor said you had liver problems?
103. Saw doctor, psychologist, social worker, counselor to help you stop drinking?
104. Until 25 (or to present age) how bad were your hangovers?
105. Past 3 years - how bad were your hangovers?
106. Driving - last year - drinks in 24 hours?
107. Type of alcohol you drank most often?
108. In life - been extremely sea sick?
109. Sea sick - ocean calm - others well?
110. Ill - cold/flu - stomach usually upset?
111. Ill - cold/flu - do you usually vomit?
112. Dropped from military service school?

APPENDIX B  
A COST BENEFIT STUDY OF THE DEPARTMENT OF THE NAVY  
ALCOHOLISM REHABILITATION EFFORT

A cost benefit analysis was carried out over a period of two years. The study examined the cost benefit impacts on:

Rehabilitation vs. Replacement

Hospitalization Rates

Alcohol Related Accidents

Jurisprudence

Productivity

The basic tenents of the study were: Should the Department of the Navy attempt to fully rehabilitate and retain its alcohol dependent personnel or would it be more cost effective to provide the minimum treatment required by law and discharge them to the care of the Veterans Administration.

The basic criteria addressed in the rehabilitation alternatives were:

Maintenance of the overall manpower inventory level.

Number of man-years of future service obtained with the rehabilitation option should be equal to or greater than man-years of service that could be obtained from any alternative solution.

Cost of rehabilitation should be less than or equal to the cost of any alternative solution.

The methodology used recognized that expenses incurred for recruiting and recruit training are marginal costs. Therefore, the cost reflected the resource impact of adding 1, 5, or 100 more to the annual recruiting load, but do not

include the fixed costs of the recruiting and training system. The cost-benefit equation used in the study was:

$$X \begin{array}{l} \text{Expected} \\ \text{Future Service} \\ \text{Cost} \end{array} + (1-X) \begin{array}{l} \text{Expected} \\ \text{Future Service} \\ \text{Cost} \end{array} = \begin{array}{l} \text{Expected} \\ \text{Future Ser-} \\ \text{vice Cost} \end{array}$$

where X = treatment success.

## APPENDIX C

### INTERVIEW QUESTIONS

The questions used to obtain the information for the study, discussed in Chapter III, are listed below:

How has the Navy been treating you?

How long have you been in the Navy?

How old were you when you first came into the Navy?

Do you plan on making the Navy into a career?

Are you married?

What is your rate?

What type of work do you do?

Have you been to sea? How long?

What do you think of the program here?

How did you find out about the program?

Have you ever been in a program like this before?

Can you tell me how many times you have been to sick call in the last six months? About how many times?

Do you feel that any of the problems you went to sick call for were related to your current illness?

Could you tell me how many times you have been late from lunch in the last six months?

When you were late, usually how late were you?

After you started to get ill did you ever have any accidents? Roughly, what was the damage?

After the illness started setting in did you have any run-ins with anyone? Did that lead to mast or some discipline action?

How do you feel about staying in the Navy?

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